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ABSTRACT

A study was conducted at Bunker Hill Community College to assess the impact of the use of learning groups on student absenteeism and academic performance. The study involved four sections of a Biology 1 class. Two sections were designated as the control group and were taught using the traditional course format, which involved a 2-hour session in the audio-tutorial laboratory, a 1-hour seminar session using a primarily lecture format, and a 1-hour testing session each week. The other two sections were designated as the experimental group and participated in learning groups rather than the 1-hour seminar session. In the learning group sessions, permanent groups of four to five students met under the direction of a rotating group leader to discuss the week's learning objectives and to clarify material. The group leader was responsible for making work assignments, monitoring attendance, and making decisions about obtaining assistance from the instructor. Study findings included the following: (1) of the 48 students in the control group, none had perfect attendance and 84% had more than three absences; (2) of the 44 students in the experimental group, 39% had perfect attendance and 5% were absent between one and three times; (3) the mean grade point average for the control group was 1.9, while that for the experimental group was 3.1; (4) the control group had higher mean reading levels than the experimental group; and (5) experimental group students insisted that the learning group method be used in Biology 2. (HB)

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IMPLEMENTATION OF LEARNING GROUPS IN AN AUDIO-TUTORIAL BIOLOGY PROGRAM

A Paper Presented to the
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IMPLEMENTATION OF LEARNING GROUPS IN AN AUDIO-TUTORIAL BIOLOGY PROGRAM

Most educators will support the opinion that it is practically impossible to be involved in a successful teaching/learning situation if students do not attend class.High absentee rates are not indigenous to any one segment of education. Excessive absenteeism is, in my opinion, germaine to the issue of attrition being addressed throughout the country. Absenteeism is rampant in the secondary schools. Naisbett(1984) noted that Boston,New York,Baltimore,Cleveland,Washington and New Orleans report chronic absenteeism which usually contributes to higher drop-out rates. Many students who have been chronically absent in the secondary schools but do not drop-out, and indeed graduate from high school, enroll in community colleges with open admission policies. Unfortunately, in many instances, although there has been a change in environment from a secondary school to a community college, absenteeism is still a blatant habit compounded by a "passiveness" when students do attend class. This presentation reports the results of a study designed to address the twin problems of "absenteeism" and "passiveness" as they impact the audio-tutorial biology course at Bunker Hill Community College.

In attempting to devise an effective instructional strategy to improve attendance, I relied on my knowledge of some aspects of cognitive style and recent findings on "learning groups" discussed in Bouten & Garth (1983). By cognitive style I mean the way a person organizes information and solves problems. As you are well aware, people differ in their cognitive style or "way of thinking". One dimension of cognitive style which has been the subject of much research is field-dependence/independence. This dimension

can be represented as a continuum with individuals at the ends of the continuum, that is, very field-dependent or very field- independent, characterized by styles very different from each other. The literature is replete with studies dealing with the development of the concept of field-dependence/independence in studies on perception through it's influence on intellectual functioning and social behavior. Witkin et al.(1977) has suggested that a student's cognitive style will influence the manner in which the student learns, makes career choices, and interacts socially. Similarly ,the cognitive style of a teacher will influence his/her approach to teaching. Field-dependent students and teachers generally tend to prefer socially oriented learning environments. On the other hand field-independent students and teachers are more comfortable in formal lecture type situations.

I focussed on the field-dependent/independent aspect of cognitive style because a recent study that I had completed at Bunker Hill indicated that two-thirds of a sample of 500 students at the college were field-dependent (Self,1983). These results suggested to me that instructional methods with a more social orientation might be more effective with such large numbers of field-dependent students. This suggestion was viewed rather skeptically by some members of the Science Department. This is not surprising since a "social" approach to teaching is probably not consistent with the cognitive style of most scientists who tend to be field-independent (Witkin et al,1977). In fact a recent study by Douglass & Kahle (1983) has shown that discussion is one of the least utilized instructional tools used at all levels in biological education.

Coupled with my knowldge that I was dealing with large numbers of

field-dependent students and buoyed by the findings of Bouten & Garth (1983) that "learning groups" enhance learning irrespective of the type of institution, type of student, level of education or subject matter, I decided to try a limited controlled study of "learning groups" in my biology course.

Method

The audio-tutorial program in biology at Bunker Hill schedules students to meet 4 hours each week with additional open lab hours available. The first class meeting of the week is a two hour session in the Audio-Tutorial lab. Here, the students, in individual carrels, listen to a taped lecture, answer study questions, and do related laboratory exercises. In addition, the students view filmloops, demonstrations etc. In essence, each student works at his/her pace during this session. The instructor is available at all times during this lab.

Approximately 2 days later, the students meet again for one hour in a seminar session to discuss the learning objectives for that week. This class usually consists of 25-30 students. Traditionally, in this class, the students are questioned by the instructor to identify areas of weaknesses. The instructor then attempts to clarify the material basically using a lecture format. Unfortunately, in most instances, only a few students actively participate. The majority of students resemble " sponges".

The third class of the week serves a multitude of purposes. It is most often used as a test period. However, it is time which may be used to present guest lectures, movies etc. I must note at this point that

Dr.Samuel Postelthwait, who is credited with the development of the audio-tutorial method in 1961, placed a great emphasis on oral quiz sessions. These quiz sessions consisted of eight students and a graduate teaching assistant. The instructor asked questions at random and each student was expected to be prepared to answer questions on all aspects of the mini-course. The students were graded on their participation in the quiz sessions. In adapting the audio-tutorial approach for the community college level,because of staffing problems, the small, oral quiz sessions were replaced by the seminar type class of 25 students which I noted previously. It is this seminar type class which was changed in the present study.

This study involved four sections of Biology I. Two sections were designated randomnly as the control group and two sections were selected as the experimental group. The control group was exposed to the exact instructional format that I have just described, a 2 hour audio-tutorial lab, a 1 hour seminar session and a 1 hour testing session etc. The experimental group differed from the control group in that the students in the experimental group were involved in "learning groups" rather that the 1 hour seminar session. The "learning groups" met in their regular classroom at the hour normally scheduled for their seminar.

The "learning groups" were highly structured as recommended by Michaelson (1983). Using the results of a questionnaire that was distributed during the first class, permanent groups of 4-5 students were formed. In creating the groups an attempt was made to spread out the "resources".Particular attention was given to a heterogenous distribution of students who had some previous science background, older individuals and

ESL students. In addition, an attempt was made to separate individuals who had pre-existing friendships as Michaelson(1983) has suggested that such relationships can impede the development of team cohesiveness. Previous research at Bunker Hill Community College has shown that a very high correlation exists between the grades that students receive in biology and their reading scores (Self et al.1984). For that reason, the student with the highest reading score in each group was initially selected as the " group leader ". Students served as "group leader" on a rotating basis for approximately 3 weeks. The responsibilities of the group leader were delineated and distributed to all students.

Group leader was a very important position as these students were expected to make work assignments to members of the group and manage the discussion of learning objectives for each unit. In addition, the group leaders were required to keep careful attendance records on the members of the group. If a student was absent on two successive occasions, the leader was responsible for calling the absent member, inquiring about their well being etc, and then informing the instructor about the situation. The group leader also had to make the decision as to when the group required outside help from the instructor. The groups in each section met simultaneously in the same room. I, as instructor, floated among groups to insure that they were functioning properly and to provide information when needed. Careful attendance records were also kept by the instructor. These records were placed in a computer file for processing later.

Results

As noted previously, my purpose was to determine if the instructional

strategy called " learning groups " would impact high absentee rates and passive behavior. Analysis of the attendance data showed that there was a significantly higher rate of attendance in the learning groups than in the control group ($p=<.001$).Histograms to illustrate these differences are in the appendices. In the control group there were 48 students. There were 49 class sessions for the semester. No student in the control group had perfect attendance. Sixteen percent (16%) of the students in the control group had only 1,2, or 3 absences for the semester. However, there was a dramatic difference in the experimental group. There were 44 students in the experimental group and they also had 49 class sessions. Thirty nine percent (39%) of the students (n=17) had perfect attendance. Fifty one percent (51%) of the students (n=23) were only absent 1,2, or 3 times. Thus, overall, 90% of the students participating in learning groups had 3 or fewer absences for the semester. The possible effect of the higher attendance rate on retention is not clear-cut. For example, in the experimental group 4 students withdrew, 2 were moving and withdrew from the college and 2 withdrew from the course. Interestingly, the 2 students who withdrew from the course asked to continue coming to class and participated for the rest of the semester. In the control group, 5 students withdrew for a variety of reasons.

A tremendous outcome from this study which was not anticipated was the significant difference in grades bewteen the two groups. The mean grade for the control group was 1.9, about a C average; the mean grade for the experimental group was 3.1, slightly above a B. In order to determine if the difference in grades was due to the experimental factor, learning groups, or to superior reading skills, the two groups were compared on the

basis of their reading scores and grades. This was accomplished by using a statistical procedure called the Johnson-Neyman technique with the Potthoff modification. The results showed that the mean reading score of the control group was actually higher than the mean reading score of the experimental group. The control group mean reading score was the 46.3 rd percentile, while the mean reading score for the experimental group was the 40 th percentile. The comparison of the two groups by the Johnson-Neyman technique indicated with 90% certainty that the region of significance extended from the 0 percentile to the 96 th percentile. In other words, the grades for all students in the experimental group using "learning groups" were significantly higher than those for the control group. Ninty-six percent of all students in biology fell into the region of significance.

It is too early to hope for any significant impact on the institution as a whole at this point in time. However, it is important to note that several of the groups formed in biology carried over into other content areas. Encouraged by the results of this study, in the Spring,1984 semester, I decided to use groups in all my sections of Biology 1. The positive reaction of students to "learning groups" was demonstrated by the fact that the Biology 1 students who participated in "learning groups" in the Fall semester in this study insisted that the Biology 2 instructor use "groups". Thus, a total of 7 sections of Biology 1 & 2 were involved in group learning during the Spring,1984 semester. A detailed analysis of the data from these sections could not be completed in time for this presentation. However, a cursory examination of the attendance records reflect attendance figures of 96 % and higher.

There are some dangers involved in implementing "learning groups". As noted by Bouten & Garth (1983) students are anxious about learning new behaviors and may exhibit this by being uncooperative initially. Conflict can arise among group members. But my experience has been that by monitoring the groups carefully and by reinforcing the notion that participating in groups is a learning experience itself, a conesiveness can be developed. Bouten & Garth (1983) note that some students may feel that the instructor is not doing his/her job if he/she is not lecturing. In this study, the students expressed the feeling that there was greater rapport between them and the instructor.

The advantages of this approach are many. Students participating in "learning groups" had significantly higher attendance rates and student achievement was significantly improved. Passive behavior was replaced by an active involvement in learning among peers. The students also appeared to be developing group skills. The groups seemed to promote friendships and offered a support system which is very appropriate for students with a field-dependent cognitive style. Indeed, particpation in "learning groups" can also be of some value to students with a field-independent mode of approach as it provides them with the opportunity to learn to work with "people oriented" people.

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" LEARNING GROUPS" in an

AUDIO-TUTORIAL BIOLOGY CLASS

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Bunker Hill Community College

Audio-Tutorial Biology

2 Hr. Lab

Students listen to Audio-Tapes; answer work-study questions coordinated with tapes; do lab exercises etc. (work at own pace)

1 Hr. Seminar

Ideally - students actively participate in discussion of the learning objectives for the unit based on information they learned in the 2-hr lab.

Practically - students exhibit "passive" behavior; they want the instructors to "lecture" on the material related to the learning objectives

1 Hr. General Session

USED for Testing, Films, Guest lecturers, etc.

Sponges
Calcarea

RESPONSIBILITIES of the GROUP LEADER

LAB: 1. DURING EACH 2 HR. LAB ASSIGN TO THE OTHER GROUP MEMBERS THE LEARNING OBJECTIVES FOR THAT WEEK'S UNIT FOR WHICH THEY ARE SPECIFICALLY RESPONSIBLE FOR THE NEXT SEMINAR. (NOTE: EACH GROUP MEMBER IS RESPONSIBLE FOR PREPARING THE ANSWERS FOR ALL OBJECTIVES BUT HAVE SPECIFIC RESPONSIBILITY FOR THE ONES ASSIGNED BY THE GROUP LEADER.)

2. THE GROUP LEADER RECORDS IN THE GROUP FOLDER THE ATTENDANCE IN LAB OF THE GROUP MEMBERS.

SEMINAR:

1. THE GROUP LEADER GOES TO THE CLASSROOM FOR SEMINAR 5 MINUTES EARLY TO SET_UP CHAIRS FOR HIS/HER GROUP.

2. THE GROUP LEADER MANAGES THE DISCUSSION OF THE LEARNING OBJECTIVES FOR THE WEEK BY THE MEMBERS OF THE GROUP. IF AFTER DISCUSSION THE OBJECTIVES ARE UNCLEAR, THE INSTRUCTOR WILL CLARIFY THE PROBLEM.

3. THE GROUP LEADER RECORDS THE ATTENDANCE OF THE GROUP MEMBERS. IF A MEMBER IS ABSENT FROM TWO SUCCESSIVE CLASSES, THE GROUP LEADER NOTIFIES THE INSTRUCTOR AND CALLS THE GROUP MEMBER. A TELEPHONE WILL BE MADE AVAILABLE.

PROCEDURE FOR "GROUP" FORMATION

FIRST CLASS MEETING

- DISTRIBUTE QUESTIONNAIRE TO BE COMPLETED IN CLASS

****

USING THE DATA FROM THE QUESTIONNAIRES,

1. FORM " GROUPS" OF 4-5 STUDENTS BEFORE THE NEXT CLASS.

BASIC PRINCIPLE IN FORMATION OF "GROUPS":

*** SPREAD OUT THE RESOURCES ***

RESOURCES INCLUDE:

- STUDENTS WITH PREVIOUS BACKGROUND IN SCIENCE
- OLDER STUDENTS (21 +)
- STUDENTS WITH HIGH READING SCORES

2. CHOOSE ONE STUDENT IN EACH GROUP AS "LEADER" FOR THREE WEEKS.
3. SET - UP GROUP FOLDERS (Names, Telephone numbers, attendance)

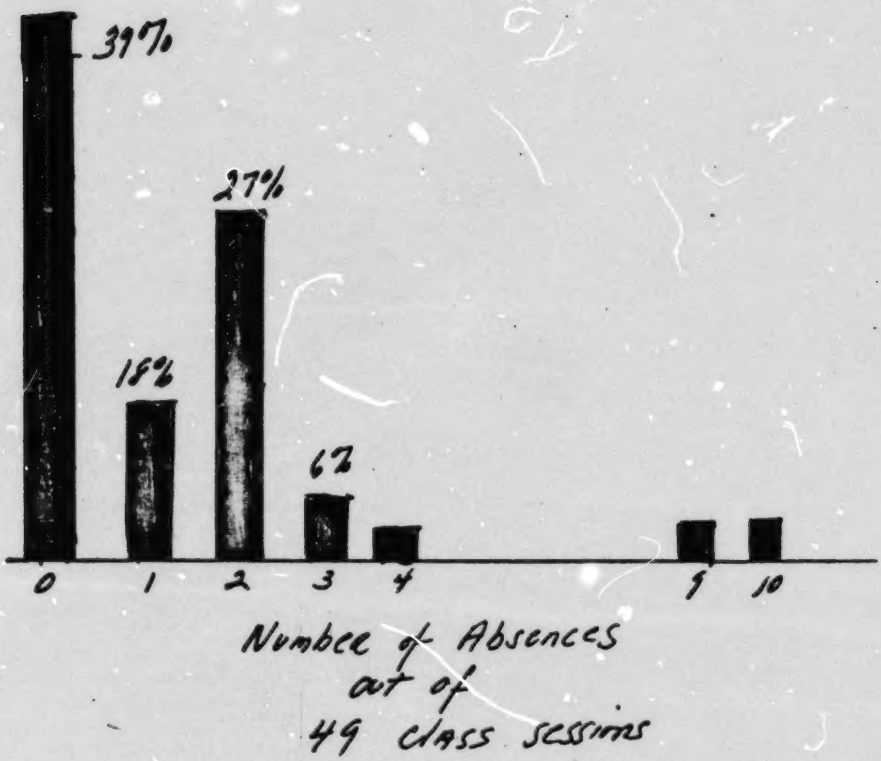
SECOND CLASS MEETING

- GROUPS MEET
- LEADER OF EACH GROUP IDENTIFIED AND RESPONSIBILITIES DISCUSSED
- FOLDERS DISTRIBUTED

ATTENDANCE DATA - CONTROL GROUP

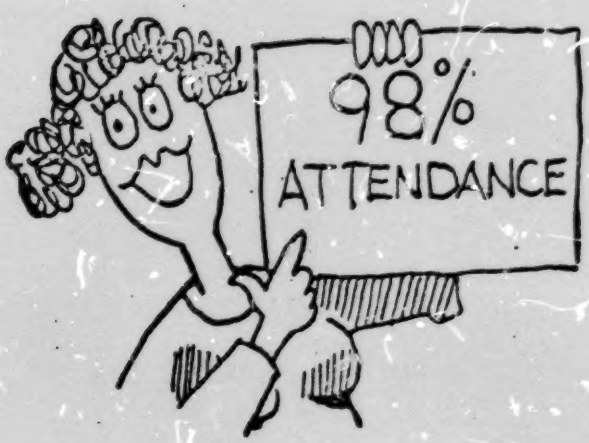
Number of Absences
out of
49 Class Sessions

ATTENDANCE DATA - EXPERIMENTAL GROUPS



- STUDENTS ARE ANXIOUS ABOUT LEARNING NEW BEHAVIORS.
  (INITIALLY, THEY MAY SHOW RESISTANCE.)
- STUDENTS ARE NOT EXPERIENCED IN HANDLING CONFLICT.
  (ACCUSATIONS OF SHIRKING RESPONSIBILITIES ETC.)
- STUDENTS SUSPECT THAT THE INSTRUCTOR IS NOT DOING
  HIS/HER JOB IF HE/SHE IS NOT LECTURING.

ADVANTAGES



** STUDENTS HAVE SIGNIFICANTLY HIGHER RATES OF ATTENDANCE.

** STUDENT ACHIEVEMENT IMPROVED

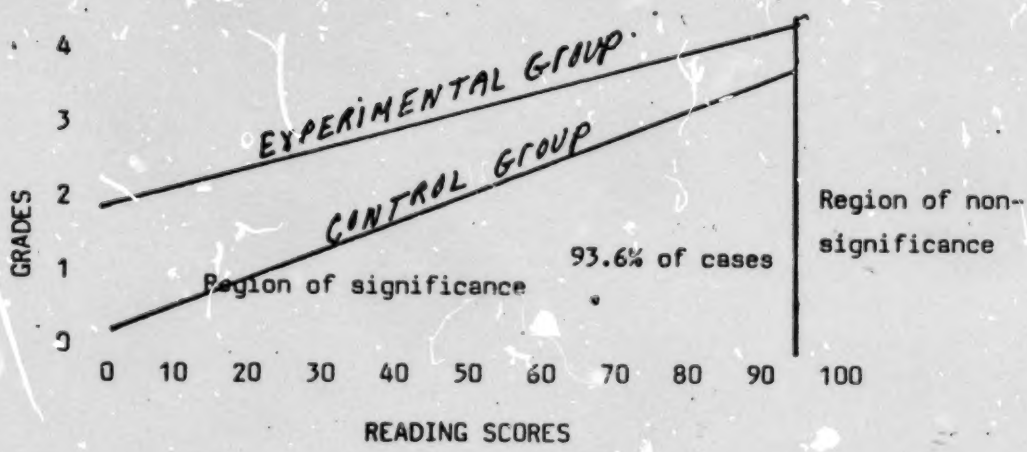
** STUDENTS ARE ACTIVELY INVOLVED IN LEARNING AND ARE RECEIVING IMMEDIATE FEEDBACK FROM PEERS.

** THE GROUPS SEEM TO FOSTER FRIENDSHIPS AND SOCIAL SUPPORT.

** THE GROUPS ARE PROVIDING AN OPPORTUNITY TO DEVELOP INTERPERSONAL AND GROUP SKILLS.

** STUDENTS ARE NOT PUTTING OFF STUDYING UNTIL JUST BEFORE A TEST.

COMPARISON OF THE EXPERIMENTAL GROUP
AND THE CONTROL GROUP
ON THE BASIS OF GRADES AND READING SCORES



CONTROL GROUP- Mean Reading score = 46.3 percentile

EXPERIMENTAL GROUP- Mean reading score = 40 th percentile

CONTROL GROUP- Mean grade = 1.9

EXPERIMENTAL GROUP- Mean grade = 3.1

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